ALM-74-6611-H

UNITED STATES ARMY
LOGISTICS MANAGEMENT COLLEGE
FORT LEE, VIRGINIA 23801-1705

GUIDELINES
FOR
ARMY ANALYSTS

HOW TO CONDUCT AN ANALYSIS
AND
PRESENT THE RESULTS

"To Manage Our Resources Wisely"

February 1989

What This Booklet Is About

In an environment of political advocacy, organizational hierarchies, and budget constraints, Army analysts face decision making processes that often operate by rules different from a directed, scientific system. Army analysts, armed with technical methods for problem solving, often encounter analytical land mines when attempting to apply the scientific method in the Army's decision making environment. This booklet is designed to offer some non-technical guidelines and to provide a structural framework within which Army analysts can apply their scientific craft.

Technical analysts, too often mesmerized by their own methodologies and enamored with their own models, tend to lose sight of the decision maker's need for timely and pertinent results. They tend to focus on the process of analyses can become off-target, non-responsive, and unsupportive of the true needs of the decision maker.

This booklet is also designed to help analysts and study planners re-focus their efforts on the real issues. It encourages the analyst to "reason through" the issues of the problem, instead of forcing the problem into the context of a particular methodology. It also encourages problem solvers and study planners to focus on how Army decision makers do in fact make decisions rather than how they should do so.

The intended objective of this booklet is not to present a "cookbook" of detailed procedures, nor is it to explore abstract, conceptual techniques. Rather, it is intended to promote an analytical approach that is designed to be more responsive to the needs of decision makers at all levels of the Army leadership.

Who Should Read This Booklet

The term "technical analyst" is used to describe the wide range of problem solvers, number crunchers, and decision scientists dispersed throughout the Army's analytical community. These technical people include operations researchers, systems analysts, information systems specialists, budget analysts, cost analysts, program analysts, R&D types, study planners, combat developers, weapon systems designers, and any other staff action officer responsible for contributing input or recommendations to Army decision makers.

It is recommended that this booklet be read or reviewed prior to the initiation of any analytical task, in order to provoke the technical analyst toward asking the right questions and solving the appropriate problems.

The term "he" used throughout this booklet refers to both men and women, as the author recognizes that nearly half of the Army's analytical community is composed of women who contribute in no small way to the Army's analytical efforts.

CHAPTER ONE: THE ROLE OF THE ARMY ANALYST

Basic Guidelines

Before initiating any study effort, the analyst should have a sound understanding of his role in the decision making process. This role can be best understood in terms of the analyst's responsibilities to the decision maker or study sponsor.

Basically, the analyst is responsible for contributing insights to the decision situation. The value of this contribution depends on the ability of the analyst to distill pertinent information to the problem and to communicate results understandable to the decision maker. The analyst's role is to explore all facets of the situation objectively, and to provide the study sponsor with information concerning the possible consequences of alternate courses of action in order to help the sponsor reach decisions.

In order to be successful at this, the analyst must approach each problem from the decision maker's point of view. Instead of simply approaching the decision situation as the problem solver, the analyst must be able to view the problem through the eyes of the problem *owner*. From this prospective, the analyst will be able to see that Army decision makers seldom face simple decisions. Most decision situations are messy ones, involving complex sets of interacting problems. Answers to these problems often involve equally complex sets of interacting solutions. Without the proper prospective, the analyst may be working diligently to find a partial solution that will not have any impact on the overall decision.

In order to gain a more global prospective, analysts and problem solvers must be encouraged to follow these basic guidelines:

GUIDELINES

***UNDERSTAND THE PROBLEM**
***BE CREATIVE**
***BE THOROUGH**
***BE ON TIME**

◊ **Take a broad view,** free of parochialism, standard procedures and traditional approaches.

◊ **Use innovative, creative thinking** in exploring alternate approaches to the problem.

◊ **Describe the limits** of the proposed analysis, so that both the analyst and the study sponsor have a clear idea of what will not be done, as well as what will be done.

◊ **Keep the sponsor informed** concerning all developments, changes, and constraints to the analytical effort.

◊ **Seek practical results** and recommendations that are capable of being implemented.

◊ **Be responsive.** An answer that is 100% right, but is late, is of no value to anyone.

The Open-minded Attitude

Each decision situation has a unique set of characteristics and should be approached with an open-minded attitude. Some analysts casually assume some universal conformity in problems, and tend to place too much value on a narrow range of solution methodologies. Instead of seeking a broad range of alternate solutions, these analysts attempt to confine the study objectives to prearranged alternatives, and try to force the problem into the context of a particular methodology. Although narrowing the range of choice certainly makes the analysis easier, the decision maker may pay a high price if some excluded alternatives are better than those considered. The analyst should always seek to discover meaningful alternatives other than those immediately obvious. The invention of new alternative is frequently the analyst's most constructive and valuable role in the decision making process.

Skilled use of the open-minded approach and creative thinking in the initial stages of problem solving can make things much easier in the latter stages of the analysis. Analytical tools and techniques can be put to work once the problem has been approached in an open-minded, free-thinking fashion. Analysts who insist on restricting themselves to conventional approaches and tried-and-true methods are too frequently satisfied with applying the "What was done last year?" approach to problem solving. On the other hand, successful problem solvers always seem to be able to attack problems from different angles, generating new approaches, and leaving the conventional thinkers to ask "Why didn't I think of that?" The open-minded attitude is often the key ingredient to problem solving recipes that provide useful insights and sound advice to the decision maker.

Advisor vs. Advocate

In the purest sense of the word, the analyst is an advisor to the decision maker. In this capacity, analysts bear a unique and binding responsibility to offer conscientious evaluations and candid insights to the decision process. Frequently however, analysts are called upon, not only to perform analyses that will aid a decision, but to present the results of such analyses in an advocacy role.

Analysts must accept the fact that the advocacy process is recognized process for the support of the resolution of conflict in decision making. This process requires that the participants attempt to influence the decisions through the presentation of their cases. Generally, this process is used with the assumption that the various viewpoints are adequately represented to facilitate the education of the decision maker. This assumption implies that the analyst who is able to represent his case through convincing briefings and presentations will be able to exercise greater influence on the decision making process.

The problem solver must constantly be aware of his position in the decision situation, as his efforts in the analytical process may shift from the exploratory role as an advisor to an advocacy role as an expert witness. Without this awareness, the problem solver may fall prey to hidden motivations that may shift conscientious evaluations toward insupportable conclusions and biased recommendations.

Ethics in Analysis

Blatant violations of ethical standards in analysis are rare, and, in most cases, these types of practices are easy to detect and eliminate. However, a more subtle form of unethical behavior can occur through a misguided application of analytical methods in the Army's decision making environment.

Major decisions involving the initiation of new programs or the procurement of new weapon systems are often made possible through the dedicated, and sometimes over-zealous efforts of the program sponsor or system proponent. In many ways, the Army benefits from the untiring efforts of these dedicated proponents, because, without their "over-zealousness," things simply would not get done.

However, the authoritative influence of a well-intentioned, but over-zealous proponent may give rise to a less obvious, and perhaps more common, form of unethical behavior. This form may be manifested as an internal conflict between over-zealous proponents and objective analyses. Caught in the middle of this conflict is the technical analyst, who is forced to choose between analytical proponency and scientific objectivity. In these cases, the analyst may be tasked with justifying a predetermined conclusion by "dressing it up in number clothes" and passing it off as scientific reasoning. This rarely accomplished without sacrificing scientific rigor and compromising professional integrity.

The discrete analyst recognizes that he bears a dual responsibility to the decision maker. On one hand, the analyst has a binding responsibility to support the decision maker. On the other hand, he is responsible for providing open and honest evaluations, even when the analysis surfaces' findings that run contrary to the results that the decision maker would like to see. Analysts who find themselves in this dilemma are encouraged to fall back on the scientific spirit and method, complete the study conscientiously, and tell the decision maker; *"With the best models and data available, I can show that if _____, then _____; but if _____, then _____ and _____and . . ."*

In recent decision situation, an analytical agency was tasked with evaluating the fate of a multi-million dollar weapon system. It was discovered that the continued development of the weapon system could not be supported by the analytical findings. When it came time to present the results to the Army leadership, the senior analyst was heard to ask "Do they shoot the messenger?" In spite of the ominous repercussions, the senior analyst completed the evaluation conscientiously, and presented the results with conviction. As a result, a wise but tough decision was reached, and no analysts were "shot." Even bad news is hard to reject when supported by quantitative facts, sound logic, convincing presentations, and professional integrity.

CHAPTER TWO: A STRATEGY FOR SUCCESSFUL STUDIES

An Analytical Approach

Processes for conducting analytical studies will vary according to the unique set circumstances characterizing each particular problem. Regardless of the similarities between problems, each problem comes with its own set of peculiar requirements and special considerations. While it is unrealistic to attempt to prescribe a standard approach that will guarantee success in every analytical endeavor, the strategy suggested in the following paragraphs presents a step-by-step guide for approaching complex issues or messy problems. These guidelines are not intended to prescribe procedural recipes, but are presented in order to provide the analyst with a suggested plan of attack.

This process is an adaptation of an analytical approach suggested by several senior-level Army analysts who have employed this method successfully in numerous recent decision situations. By examining how Army decision makers do in fact make decisions rather than a focus on how they should do so, this problem, instead of forcing the problem into the context of a particular methodology.

Too often, the methodologies of analysis become over emphasized, as analysts tend to focus on the analytical tools and models rather than on the products. In order to put things into the proper perspective, study planners should use the "40-20-40" rule. That is, 40 percent of the effort allocated for a particular study should be devoted to problem definition and front-end analysis. Twenty percent of the effort should be spent on the actual number-crunching, and the remaining 40 percent should be allocated to examining the answers and packaging the results. With this perspective, study planners and senior analysts can begin to map out problem solving strategies that are far more responsive to the true needs of decision makers.

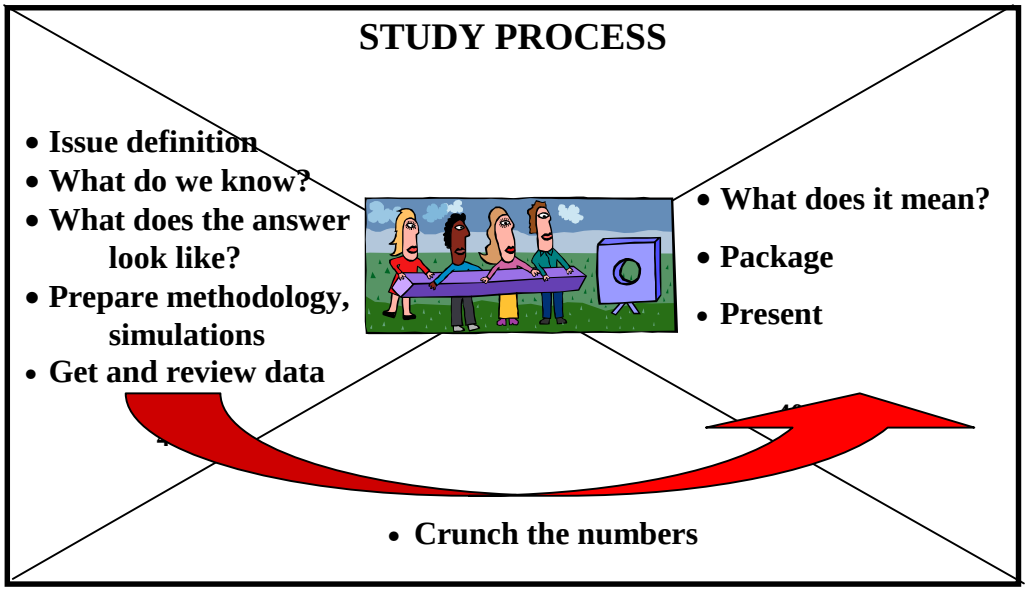
Defining the Problem

The most important (and most difficult) task of the analytical process is that of defining the problem. While nearly all problem solvers agree that this part of the problem solving process is most critical there is little agreement as to what "defining the problem" exactly means. The following guidelines provide for the analyst some practical tips on how to accomplish these critical phases of the problem solving process.

Problems must be defined from the perspective of the *problem owners*, not from the perspective of the problem solvers. Usually, the directive that establishes the requirement for a study must percolate through several echelons of leadership prior to reaching the group that must do the actual work. In many cases, each echelon adds questions that they feel the ultimate decision maker may ask. Many of these additional "what if" questions are important, but they may obscure the true problem faced by the original problem owner, and may cause the study team to focus on tangential issues. In order to zero in on the real problem, the analyst must make every attempt to get face to face, or voice to voice, with the key problem owner. It is critical to

establish exactly who cares about the various issues to determine which are key and which are "nice to know."

In order to focus on the critical issues, several key questions should be asked during the problem definition phase of the analytical process.



What will be done with the answer? Is this study part of a larger analytical effort? Will the results of this study feed into a resource-related decision, or will the results simply be used to furnish "nice-to-know" information? If the study results will not be used to provide information needed to support a resource-related issue, does the study really have to be done? Asking these types of questions will help the study planner prioritize analytical tasking and allocate his resources to the hot issues.

How accurate must the answer be? Are we tasked with choosing the best from a given set of alternatives, or are we being asked to determine the best among an infinite number of solutions? Armed with automated methods for finding perfect answers, many analysts are too eager to plunge into the vast reaches of the entire solution space seeking the wily and elusive optimal solution. However, many study sponsors are not looking for the perfect answer. They are simply concerned with getting help in picking the best between alternatives A, B, and C. Are we required to provide results accurate to hundreds of dollars or millions of dollars? Item level or theater level? Rounds per day or tons per year? Constant dollars or current dollars? Is the decision sensitive to minor changes in the input? Will the answer be quoted by a high ranking official, and later be used as a force-level target or as a cost ceiling? Answers to these and other related questions should define the scope of the problem and provide early warning of sensitive issues.

Who cares? Who is the key player, the one who must ultimately make the final decision? Prior to reaching the final decision maker, what other key players or organizations

with a vested interest are likely to become involved and will have to be pre-briefed or won over? If the answers to these questions indicate that high-ranking, non-technical individuals are the decision makers, some very special considerations must be surfaced during this initial stage of the problem solving process. The analyst must realize early in the process that the answers and insights determined by the study eventually will have to be communicated to and accepted by all the key players. Otherwise, the entire problem solving effort will be for naught.

When must the decision be made? Many decision situations arise under short-fuzed circumstances requiring rapid response times. Analysts must realize that when the decision point arrives, the decision will be made with or without their input. Unfortunately, too many technical analysts, oblivious to decision times and short-fused suspense's, provide solutions that are 100% correct, which arrive after the decision has been made. An answer that is 80% right, but arrives on time, is much better than a perfect answer that is late. One senior-level decision maker relates: "It is as if my office is burning down, and I want to know which exit door to use. Instead of telling me Door A or Door B, the technical guys give me a compass direction in degrees and in mils, the distance to the nearest door in centimeters, and they give me all this information after my office has burned down." It is imperative that all analysts and problem solvers provide a "good enough" answer within the time constraints of the decision situation.

What we do know? For many years, the Army has obtained vast amounts of analytical findings from its loose network of analytical agencies and research commands. The diversification of study efforts among overlapping organizational missions almost guarantees some duplication of effort. Many problems that arise today have occurred before; and many have been solved before. To protect against duplication of effort, and to insure that decisions are not made with needlessly insufficient information, the analyst must conduct a thorough literature search during the early stages of the problem solving process.

Numerous governmental and commercial activities have produced vast databases of information. Questions previously very difficult to answer by manual reference methods are now made manageable through automated information resource centers (DTIC, DLSIE, NTIS, DODSIS, ITAC, DIALOG and others). The analyst should become familiar with the automated information retrieval systems available, and use these systems to conduct the literature search. Properly conducted, this initial search will reduce duplication of analytical effort, and will promote a more efficient use of analytical resources.

The Front-End Analysis

The next phase of the problem solving process involves a mixture of some hard thinking, creative reasoning, and educated guesswork. Many problem solvers, eager to apply their analytical tools, often leave out this part of the study process. The following questions are provided in order to encourage the analyst to "reason through" the entire problem, and to help the analyst avoid forcing the problem into the context of a particular model or methodology.

What do you think the answer is? Early in the study process, the analyst must reason through the issues of the problem. The analyst should attempt to determine what the answer is;

not to the 5th decimal place, but close enough to gain some appreciation for the problem's order of magnitude. If done properly, this "back of the envelope" approach will alert the analysts to the critical and key issues of the problem. Doing this step early, the analyst will find an intuitive answer to the problem. This will identify the "drivers" behind the decision. The "drivers" are those things that, if changed, will change the answer.

Some critics will claim that, by doing this front end analysis, the analyst is introducing bias into an otherwise open-minded approach to the problem. They claim that the analyst may force the remainder of the problem solving methodology into some pre-determined structure, thus increasing the probability of making a Type II error (accepting a false hypothesis). The careful analyst should be aware of this tendency, and should take precautions against becoming too enamored with his initial "back of the envelope" insights. The purpose of this step in the study process is not to introduce Type II error. The purpose of this step is to minimize the opportunity for "Type III error"--(solving the wrong problem).

What do you need to find out? Many complex problems can be addressed by first decomposing the issues to be resolved into less complicated sub-elements. The essential elements of analysis focus attention on the critical issues of the study, and force the analyst to establish a study plan responsive to these issues. The essential elements of analysis should:

- be written clearly and succinctly,
- be stated in the form of questions,
- lend themselves to some form of measurement,
- contribute to the study objective, and
- be complete.

Once formulated, these elements will be great of value in selecting the appropriate criteria and methodologies to be used in the analysis. It is also important at this point to start identifying the assumptions that are also associated with these criteria and methodologies.

Assumptions are inherent in almost all decisions' situations. Assumptions can be used to bound the problem or to define the scope of the analysis. The analyst must keep in mind that assumptions can reduce the problem only artificially. If any assumption begins to take an overwhelming importance, then it should be re-evaluated. All assumptions, explicit and implicit, must be identified, and the analyst and the decision maker both must be in agreement as to what the assumptions are.

What do the final charts look like? During the front-end analysis, problem solvers should give thoughtful consideration to how the results of the study will be presented. The analyst should project his thoughts into the future by assuming that the analytical work has been completed and by formulating questions that are likely to surface concerning the results. This is the true test of whether the front end analysis has been done properly.

If the analyst has thought through the problem, and has developed his "back of the envelope" solution, then he should know how to display the results so that it can be understood

by the decision maker. The shapes of the curves may change based on the results of the actual analysis, but if the analyst can "rough out" the charts, then ha has a solid handle on the exact questions which must be answered.

This is not always an easy task to accomplish, and it requires considerable thought. Some frustrated analysts complain: "I don't have the foggiest idea what the final charts look like. I don't even have any numbers yet." Upon hearing these complaints, one senior Army analyst remarked: "If you tell me that you don't have any idea what the final charts will look like, go back to square one. You don't know what the problem is. This is part we can't trade off; because, if we fail to do this up front, I guarantee you that we'll pay for it in the end."

By performing this thought process up front, the problem solver will become alert to those pieces of information uncovered during the analysis which may be useful in presenting the results to the key decision makers. This pre-analysis will also provide guidance concerning the key items of information to be collected and later used as critical documentation in support of the final briefings.

Models and Methodologies

Define solution techniques. Unfortunately, this is the point where many analysts begin. Too often, problem solvers immediately attempt to classify the problem in terms of a solution technique. Instead of selecting the technique which best fits the problem, these analysts attempt to apply the problem to a pre-selected technique. The analyst who attempts to force the problem to confirm to a pre-selected methodology is usually considering only a narrow selection of variables and alternatives with which he has the most familiarity.

Another pitfall to avoid is the tendency to allow the complexity of the methodology to become more significant than the problem itself. This may lead to "paralysis by analysis," a disabling condition which causes the entire analytical effort to stagnate in the encumbrances of a complex or inappropriate methodology. The validity of the study should depend on the completeness of analysis, rather than on the complexity of the techniques.

Frequently, analysts face the temptation to put computers to work as a substitute for hard thinking. Forcing a problem into an analytically tractable framework by emphasizing the ease of automated computations will surely compromise any analytical effort. Along these same lines, the analyst should avoid trying to use techniques more complicated than those warranted by the data.

Tips on using models. All models are wrong. Including yours. The important question to ask is: "Is it wrong in dangerous ways?" By definition, a model is a simplified representation of the entity it stimulates. Inherent in this definition is the unavoidable fact that every model contains imbedded assumptions and intrinsic limitations. Is the current decision situation sensitive to these limitations? Without complete knowledge of the design and limitations of the model, analysts may be applying this tool in dangerous ways. The application of any model

without a full understanding of its limitations and assumptions can jeopardize any study effort, and lead to decisions supported by technically invalid results.

In many analytical organizations, the original model designers have moved on to other assignments, taking with them the institutional memory required for the appropriate applications of the model. The remaining analysts face a peculiar dilemma. On one hand, the study process calls for a specific model to be designed for the specific decision situation currently under investigation. On the other hand, recurring decision cycles and short suspense calls for a "ready-rack" of standing models to provide a quick response to the decision maker. As a result, the analyst is frequently coerced into running the in-house model first, and then examining the results for relevance to the decision situation at hand. In effect, he is turning the scientific method inside-out.

In order to avoid this tendency, the study team should, at least, challenge the appropriateness of the model in question. Problem solvers and analysts seeking an appropriate combat model to satisfy to current decision situation often encounter a confusing set of available computerized battlefield simulations.

The need for insights into the combined effects of weapon systems on the battlefield has spawned a proliferation of hundreds of combat models and battle simulation tools. Behind each model stands a team of analysts, ready to defend their model and eager to apply it to the next resource-related question. This situation has resulted in a loose collection of competing model proponents, each armed with his own favorite "hammer," looking for likely "nails." Because different combat models frequently offer contradictory results, these proponents often end up hammering each other. Meanwhile decision makers continue to wrestle with the complex issues of resource-related questions, as the combat modelers continue to wrestle with those inconvenient realities of the battlefield which do not seem to fit into their simulations.

Problem solvers should challenge the model owners by asking: "Which aspects of the battle were modeled in detail? Which were approximated? "Which were left out?" The most important question to ask is: "Which class decisions was the model designed to support?"

Challenge the model owners

- **Which aspects of the battle were modeled in detail?**
- **Which were approximated? Which were left out?**
- **Which class of decisions was the model designed to support?**

In attempting to find answers to these key questions, analysts may discover that the application of their in-house model to the current decision situation may be an inappropriate use of that model. At worst, it will result in a poor decision.

In an effort to exercise some degree of quality control over the use of new and existing combat models, the Army modeling community conducts periodic peer reviews on a number of current combat models and on various battlefield simulation technologies. During these reviews,

several recurring questions seem to gain the most attention and spark the liveliest debates. These questions include:

How does your model represent C_2?
Do you "mirror image" red and blue?
Does your model play suppression?
What's your ratio of simulation time to real time?
Is your model documented?
Where did you get your data?

When a problem solver decides to use a particular model, he must be prepared to provide satisfactory answers to each of these questions. Problem solvers must remember that modeling is not analysis. However, if an appropriate model is judiciously selected and thoroughly understood, the chances for the misapplication of the model are reduced, minimizing the opportunity for a decision supported by technically invalid results.

Get and review the data. Decisions are seldom based on perfect information. Part of the analyst's job is to discern what information is pertinent and meaningful, and to use this data in the problem solving process. However, lack of appropriate data, and inaccurate or invalid data are the source of many fruitless analytical efforts. Many study efforts are based on sound analytical design, however the results of these studies become questionable when the techniques are applied to invalid data.

One source of error lies in the unchallenged acceptance of "official" figures. Analysts must challenge sources of information. They must examine all the data upon which the analysis is based. They must determine how it was derived, and must check it for accuracy. It is important to remember that one of the key functions of the data gathering procedure is that of rejecting bad data and inaccurate information.

Crunch the numbers. Contrary to popular belief, analysis is not number crunching. As already mentioned, analysis involves a lot of hard thinking. Much of this hard thinking must take place before any numbers can be "crunched." Given that the front-end part of the problem solving process has been completed, it is now time to turn on the calculator, PC, or mainframe and let the computers carry out the drudgery of any detailed and repetitious mathematical computations.

The problem solver must acknowledge that qualitative analysis, a subjective assessment of the more intangible attributes of the problem, also has a place in the evaluation process. Analysts must not overemphasize the use of numbers. Numbers provide insight to answers, and are not answers in themselves.

What Does the Answer Mean?

The real analysis starts when the computer stops. Once the grinding work of the computer in the previous step produces results, the analyst must ask:

"Are they what we expected?"
"If not, why?"
"If so, should we believe it?"
"If we believe it, will the decision maker believe it?"
"How do we prove to the decision maker that the answer is correct?"

Asking these questions will enable the analyst to view the results from the decision maker's perspective. This gives the analyst an opportunity to challenge his own work, as it surely will be challenged by the decision maker.

The analyst must compare these results to those results obtained to those results obtained through the front end analysis. If these results are in agreement with each other, then the analyst's intuitive solutions have been validated by the actual results. If the results of actual study do not agree with the solutions to the front end analysis, then one of the following two situations has occurred:

1.An error was made in number crunching **OR**
2.A non-intuitive answer has been discovered.

If the actual analysis has uncovered some insights that were not apparent before the study was done, a true non-intuitive discovery has been made. However, if the analyst failed to do the front end analysis, it is impossible to determine whether or not any non-intuitive insights have been discovered. It is very important to make this determination, because non-intuitive discoveries tend to be controversial in nature and are often difficult for the decision maker to accept. The analyst must gain an awareness of the impact of his findings in order to effectively communicate this impact to the decision maker.

The results of an analysis are of no value to the decision maker if the recommendations cannot be implemented. Problem solvers must produce recommendations that make sense within the operational framework of the sponsoring organization, as opposed to pursuing an aesthetically pleasing approach that cannot be implemented.

Another pitfall is the problem of unintended consequences (the development of recommendations that produce a new set of problems). The analyst cannot, of course, guarantee against all untoward future events. However, he should examine the likely consequences of each recommendation in sufficient detail to be able to make a judgment call that the cure is, at least, no worse than the disease.

Packaging the Results

The most ingenious use of innovative scientific techniques is a wasted effort if the analyst fails to communicate the results to the decision maker. A senior Army official recently remarked: "You can analyze it, but if you can't sell it, the analysis is for naught."

Problem solvers must be able to package results of their analytical effort so that decision makers can understand the insights and implement the recommendations. A poorly packaged technical presentation contributes additional confusion to an already complicated decision issue. Analytical resources are wasted, and poor decisions result.

In order to avoid this situation, analysts must recognize the fact that analytical findings are seldom accepted based on technical merits alone. If the analytical findings are to have any impact on major decisions, a considerable amount of personal convincing and non-technical marketing must be accomplished. This non-technical marketing can be successfully accomplished through effective communication of the study results.

Briefings. Communication of analytical findings can take place in two ways: written reports and briefings. While written reports can provide excellent technical documentation of a study, nearly all major decisions in the DoD today are based on the merits of the BRIEFING, not the written report. The briefing has become the arena in which senior DoD officials acquire information, examine alternatives, and make decisions. Analysts must know how to make an impact in the briefing arena in order to have an impact on Army decisions.

Once the study has been completed, the results are usually packaged and presented to the senior analysts. These individuals challenge each figure and scrutinize every step. As the study results are briefed up the hierarchy of senior analysts, the briefing package tends to grow in volume and technical complexity. During this process, the briefing package becomes a very technical package. When it comes time to brief the non-technical decision maker for the final decision, many analysts search through the visuals of the technical briefing package and select some for the non-technical audience. This is a common mistake, and a dangerous one. The non-technical visuals are not to be found in the technical package. The analyst must start over, and completely re-package a briefing for the non-technical audience. Detailed discussions concerning the preparation of effective presentations are presented in the next chapter.

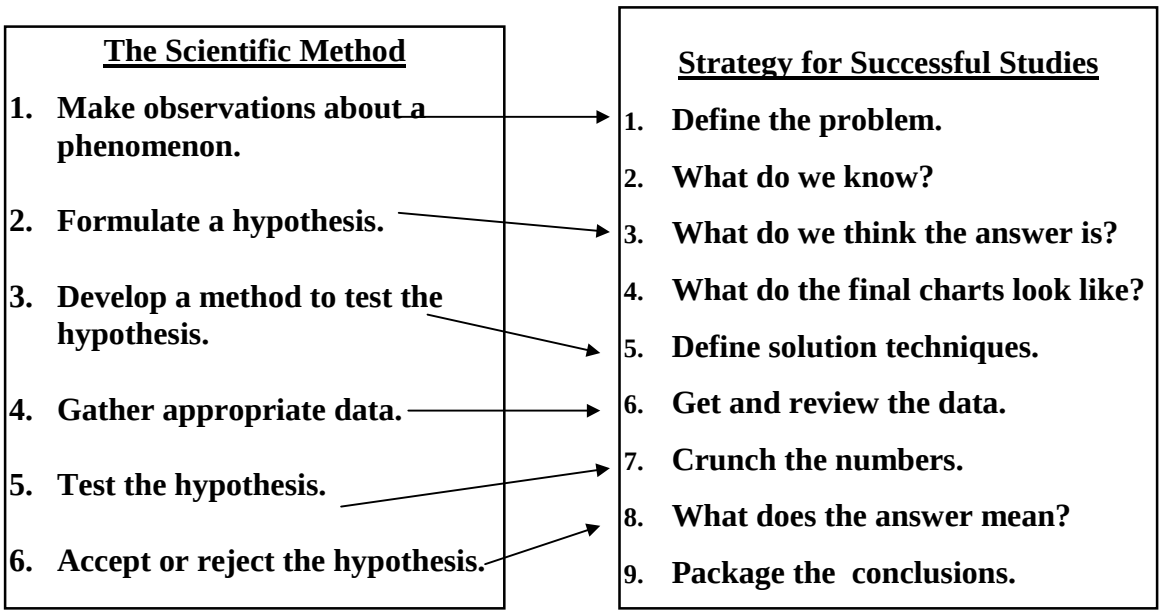
The written report. Written reports should present up front the major findings and conclusions in a succinct, understandable format. All supporting details should be extracted and placed in appendices or attachments.

For some studies, specific staff study reporting formats are prescribed by the sponsoring organization. These formats tend to be prescriptive in nature and often require strict adherence to prescribed reporting configurations. While these prescribed formats provide comprehensive written documentation, the analyst should keep in mind that the main objective is to communicate insights, and not to simply fill in the blanks.

Even when restricted to using a specified format, analysts should continue to communicate clear, concise, and persuasive results, and attempt to adhere to the prescribed format as much as possible. When it becomes obvious that the significant gems of a great analytical effort may become buried within the obscurities of a restrictive written format, the analyst should prepare two reports-one report to satisfy the prescribed documentation requirements, and a second, more overt report, submitted to the sponsor in the form of a special report or an impact memorandum. The analyst should never allow specified staff study reporting formats to stand in the way of communicating clear, concise, and persuasive results. The decision maker expects thoughtful insights that are supported by logic, analysis, and data -- not just a report full of numbers.

Summary

The Strategy for Successful Studies presented in this chapter is more than a collection of clever tips and insights from some successful Army problem solvers. This strategy maps out a series of steps which, when followed completely and conscientiously, injects the structured logic of the scientific method into the Army's decision making environment. This strategy does not replace the scientific method, nor does it sacrifice scientific regimen. Rather, it applies the textbook scientific method and the academics of problem solving to the way we do business in the Army. It takes into account the Army decision makers do in fact make decisions, rather than focus on how they should do so. By offering study planners a framework for a more practical and objective application of the scientific method, this strategy promotes a more sufficient use of the Army's analytical resources in a manner which is more responsive to the true needs of the Army's decision makers.



CHAPTER THREE: HOW TO PRESENT YOUR RESULTS

At a recent briefing presented by an operations research analyst to a panel of several general officers and high-ranking DOD officials, the analyst concluded with the traditional phrase: "Gentlemen, this concludes my presentation. Are there any questions?" This evoked no response from the panel members, and the analyst felt satisfied that he successfully enlightened his audience on the technical topics presented. Shortly afterwards, the analyst was informed that the entire briefing would have to be "repackaged" and again presented to the same panel. When the bewildered briefer asked "Why? They didn't ask any questions," an associate replied, "That's because they didn't understand a word you said."

Too often, analysts enter the briefing arena prepared to provide technical information, but unprepared to provide this information in a form that decision makers can readily understand, evaluate, and implement. Some briefers tend to emphasize the depth and thoroughness of their efforts by presenting, in gory detail, every step of the process, each data point encountered, and every technical complexity involved. These analysts would like to believe that the technical merits of the study will guarantee the acceptance of the results. They feel that a good technical study will sell itself. There exists a considerable amount of evidence from recent briefings to show that this seldom the case.

Decision makers prefer to live with problems they understand rather than with solutions they do not understand. Many senior DoD decision makers have expertise in areas other than technical fields, and these decision makers are not impressed with technical complexity and scientific detail. They are more concerned with the questions such as: "How can this information assist me in making the decision? What is the bottom line? Should I believe it? Why?"

In order for the results of a technical study to be accepted at the highest levels, the analyst must be able to communicate technical insights as lay decision options, without getting bogged down in technical detail. Analysts should not assume that the answer to the decision maker's problem is hidden in all the data. The purpose of the briefing is *not* to show the decision maker all the data, and let him find the answer. Analysts must realize that many decision makers are not technical experts. The detailed display of too much technical information contributes additional frustrations to an already complicated decision issue.

All problem solvers must be able to "package" the results of their analytical efforts so that decision makers can understand the insights and implement the recommendations. Analytical findings must be packaged for decision maker implementation, not for technical fascination.

Some common misconceptions:

"A good technical study will sell itself."

"All decision makers are technical experts."

"The briefing is just some event tacked on the end of the study."

The key ingredient of this packaging process is the analyst's ability to translate technical findings into specific alternatives and consequences that the decision maker can readily understand.

Translating Technical Ideas

The translation of technical findings into lay decision options requires more than the judicious selection of words and minologies. The analyst, educated in the scientific process and steeped in scientific systematic procedures, must turn to alternate modes of looking at his own technical work. By viewing the analytical efforts from the decision maker's perspective, communication between the analyst and the non-technician becomes, receiver-oriented, and the true insights can be made visible in the decision making process.

User receiver-oriented communication. Traditional models of communication rely on the *transfer* of encoded meanings. Unfortunately, technical meanings are not easily encoded. Receiver-oriented communication suggests that the successful communication of technical ideas can happen when the briefer is able to *create* meaning in the minds of the decision makers. In *Communication Within the Organization*, W. Charles Redding notes:

> The failure to observe the notion that meanings are *created* in people is probably the cause of one of the most persuasive errors in everyday communication. This error has been labeled the *content fallacy.* What happens all too often is that we keep tinkering with the contents of the sender's message rather than finding more ways of making sure that the receiver's responses are appropriate. The content fallacy leads us to believe that we are "getting through" to our audience merely because we are getting through to ourselves.

In order to avoid the "content fallacy," technical briefers must be able to get inside if the mind of the non-technical decision maker, and *create meaning* there. This requires a thorough understanding of the decision maker's knowledge, prejudices, attitudes, experiences, and needs. In this way, the communication of technical insights becomes *receiver-oriented*. The analyst must view the technical findings from the decision maker's perspective, and create meanings relevant to that perspective.

How to create meaning. One good rule to remember is to always relate the unfamiliar to the familiar. For example, if you are speaking to a Congressmen from Missouri, you could say that Country *X* has an area of 142,000 square miles. It would be more meaningful to say that Country *X* has an area twice the size of Missouri. If you had to explain that Country *X* has a population of 700 people per square mile, you should relate this to something familiar: "The population density of Country *X* is 700 persons per square mile as compared to 54 persons per square mile in the United States. In other words, Country *X* is 13 times more than the U.S."

As another example, let's say you solved a complicated scheduling problem using a stochastic capacitated network flow process. Rather than try to explain this procedure to a non-technical decision maker, you might try to relate it to something familiar by stating: "We used a

scheduling procedure that was used successfully by NASA for Projects Gemini and Apollo. Our results were equally successful."

Use picture comparisons. Abstract numbers have little meaning to most people. Meaningful ideas can be created by using pictorial illustrations. For example, stating that the Houston Astrodome is 210 feet high is relatively meaningless. However, by stating that on could place a twenty-story building under the roof of the Astrodome, a more meaningful picture is created. As another example, let's say that you determined the weekly re-supply requirements for a certain organization to be 442 tons/week. The quantity, 442 tons, is difficult to picture; but if you say that this is equivalent to 20 tractor trailer loads, a pictorial illustration is generated.

Use the right numbers. Percentages are common quantification's used by analysts; however, analytical findings can lose their significance if expressed as mere percentages. For example, instead of saying "20 percent savings," relate this figure to something meaningful : 10 more battalions trained; 8 more day-care centers constructed; 2000 additional high school graduates recruited; 10 more sorties available; etc.

Scientific notation is another common way technical people quantify things. Large numbers loose their significance when presented to non-technical people in scientific notation. For example, after formulating a capital budgeting problem using integer programming, a senior analyst pointed out to the decision maker that there were $2^{60,000}$ possible solutions to the problem. When it became apparent that the decision maker did not appreciate the enormity of the task, the analyst explained: "This is approximately equal to eight times the weight of the sun in grams." Get the picture?

Keep it simple. In attempting to create meanings within the decision maker's perspective, do not go overboard. Do not use complex analogies which attempt to relate technical ideas to more complicated issues. Your mission in communicating insights is to shed light, not heat.

The Briefing Process

The translation of technical results lay decision options is an on-going task that takes place throughout the entire problem solving process before they start to consider the presentation of the analytical results. By then it is too late.

The briefing is not just an event. The briefing must not be treated simply as some event that is tacked on to the end of the study. Analysts must view the briefing as an entire process. The briefing process starts during the problem definition phase of the study process. These key actions are:

1. Analyze the audience.
2. Specify the objective.
3. Sequence the main ideas.
4. Create visual displays.
5. Deliver the briefing.
6. Re-package for the next key player.

When completed in the proper sequence, these steps insure that the study finding s will have a major impact on the decision making process.

Common mistakes. Many problem solvers fail to perform these steps completely or attempt to conduct these actions out of sequence. One common mistake involves the practice of pre-selecting one or two clever visual displays, and then attempting to grow an entire briefing around the pre-selected visuals. Practitioners of this technique usually focus all their attention on the graphics, while losing sight of the briefing objective and totally neglecting the audience analysis pat of the process.

On the other hand, successful briefers' recognize that the "who are we briefing" issues must be totally researched before the study team can begin to address the "what are we showing" questions. Performing the steps of the briefing process in the proper sequence is essential to the successful presentation of the study results.

Analyze the Audience

The first step. Audience analysis is the first step in the briefing process, and it begins during the initial phase of the problem solving process. In many cases, analysts who are tasked with presenting a briefing are confronted with a short suspense. In their efforts to "produce," many analysts skip the audience analysis step, and immediately begin to compile information and construct visual displays. Without a solid understanding of the

The Briefing Process

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audience, there can be no guarantee that the package will be on target. In order to insure that the information and the visuals will be effective, the audience analysis step must be done first. As already mentioned, the analyst must first get inside the mind of the decision maker, and build the foundation of the presentation on the decision maker's knowledge, prejudices, fears, attitudes, experience, and needs.

Initial questions to ask. The initial step in any problem solving methodology involves the task of defining the problem. As part of the problem definition phase, the analyst must include some probing questions concerning the ultimate decision maker to whom the findings eventually will have to be presented. Some questions to be asked should include: Who is the key decision maker?

What type of background does he/she have?
When must the decision be made?

How to get information. Perhaps the most important tool to use during this information gathering phase is a very simple one - *the telephone*. Before the analyst attempts to package any briefing, he should telephonically request information regarding the following:

- ✓ Recent briefings given to the decision maker: Find out who has recently briefed this decision maker. Contact this person and ask: "How did it go? What got the decision maker's attention? What didn't he like? What topics should be avoided?"
- ✓ Recent briefings given by the decision maker: Most people give briefings in the same manner in which they like to receive briefings. Find out if the decision maker has given a recent briefing or is scheduled to deliver a presentation in the near future. Plan to attend the presentation , or at least try to get a copy of the visual displays. You can learn a great deal about the decision maker by investigating the way in which he prepares a presentation.
- ✓ Biographical backgrounds, command information, and tips concerning recent issues. The decision maker's staff members are prepared to provide this information to you because they are also concerned that briefings to the boss are conducted smoothly. This helpful information is usually just a phone call away.

As this information becomes available, it must be incorporated into the briefing package. The time invested in order to get this information early during the packaging process will result in valuable payoffs at the end.

Focus on the decision maker. During the problem solving process, analytical findings will begin to emerge. As these insights come to light, he analyst must constantly consider the analytical impact from the decision maker's perspective. One way to accomplish this is to ask a series of additional questions include:

How much does the decision maker know about the situation?
What information does the decision maker want?
Why does the decision maker want it?
How will the decision maker react to the findings?

As the briefing package begins to take shape, the presenter must continue to perform audience analysis by focusing on additional questions:

What is the decision maker's image of the presenter?
Where will the briefing take place?
Who else will attend the briefing?
What are their views of the findings?
Who else will be affected by the briefing?

By asking these questions throughout the entire problem solving process, the analyst can insure that his presentation will remain on target. If the briefing is to be presented to different decision makers or to several audiences, the analyst must insure that a complete audience analysis is conducted for each presentation.

Packaging the Answers

Packaging the results of a study involves much more than assembling a collection of facts, figures, and visual displays. Once the audience analysis step has been accomplished, the analyst should start the packaging process with a specific objective in mind. Once formulated, this objective can serve as a focal point for structuring the key concepts of the presentation into a logical sequence of ideas.

The Briefing Process

1. Analyze the audience.
2. **Specify the objective.**
3. **Sequence the key ideas.**
4. Create visual displays.
5. Deliver the briefing.
6. Re-package for the next key player.

Specify the objective. Every presentation must have an objective. The objective serves as an established standard against which success can be measured. By establishing a clear objective, the analyst will be able to judge the effectiveness of his presentation. Too often, analysts launch into the construction of a briefing without any clear objective in mind.

In formulating an objective, too many analysts miss the target by asking the wrong question. Analysts should not attempt to establish the briefing objective by asking: "What do we have to show the decision maker?" By asking this question, the analyst will find that there are many things that can be shown to the decision maker; but that things should be shown? Instead of asking *What*, the analyst should focus on *Why*. The "right" question to ask is: Why is the decision maker attending the briefing?

Asking this question will not only focus the analyst's attention on the decision maker's perspective, but it will also keep extraneous information and tangential issues from entering into the presentation. More importantly, this helps to focus on another key question:

What do we want to happen as the result of this briefing?

Once the analyst has "zeroed-in" on the right answers to the right questions, a clear briefing objective can be established.

Put it in writing. Formulating an objective may take some time, and it may seem frustrating for the analyst who wants to get started. Once formulated, the objective serves as the analyst's primary focal point for the remainder of the briefing process. For the objective to be effective, the analyst must put it in writing. The written objective keeps the entire briefing process on track. The written objective also serves to keep the analyst's supervisors informed as to what will happen as the result of the briefing. Once it is established in writing, the objective keeps all the members of the study team on the right track toward a common goal.

Formulate the main ideas. Once the objective has been established, the analyst should make a list of the key ideas that must be communicated in order to accomplish this objective. Notice that no visual displays have been considered yet. Visual displays should be used to support the key ideas, but it is first necessary to formulate these key ideas. Once formulated these ideas can be organized into a logical sequence, and this organization will serve as the framework for the entire presentation.

Sequence the main ideas. Many analysts, having surfaced analytical insights using the scientific method, feel compelled to communicate their results using the same approach. These analysts often insist on presenting their findings using The Scientific Approach:

1. *State the problem.*
2. *State the facts bearing on the problem.*
3. *State the assumptions.*
4. *State the approach.*
5. *State the results and conclusions.*
6. *Make recommendations.*

While this traditional approach is a useful one, and one that is successful in many situations, the analyst should not feel restricted to using this one approach. Many other organizational patterns exist. The task of developing the contents of a briefing is not just a simple matter of choosing a particular pattern. The purpose of organizing the briefing is to establish a *logical sequence of ideas* which is uniquely designed to accomplish a specific objective for a specific audience.

Logic is the key to persuasion for any presentation. The analyst must identify the key ideas and arrange these ideas in a logical progression that drives home the main point of the briefing.

In order to arrive at a logical sequencing of ideas, it is helpful to use some backward planning.

1. Determine what must be said as the “closing argument” (the main idea, the key issue, the bottom line).
2. Determine the ideas that must be presented just prior to stating the closing argument. These ideas are called the “critical messages.”
3. Determine which pieces of evidence (analytical findings) must be presented in order to support the critical messages.
4. Determine whether or not any previous findings will have to be refuted or challenged.
5. Develop the opening statement, and any background information.

Once the logical sequence of ideas has been established, the analyst has a solid framework to support the entire presentation. With this framework in mind, the analyst can now begin to create effective visual displays which will help communicate the key messages of the presentation.

Creating Winning Visuals

Many briefers begin briefing preparation by starting to draft visual displays. These briefers often select graphics from a written report or prepare a set of visual displays that “look good." They then try to find words to go with each visual display. This mistake often results in a presentation which is disjointed, has no clear focus, and is not aimed at any particular audience. These briefings are almost doomed from the beginning.

Effective visual displays are designed to support the work done in the first three steps of the briefing process: audience analysis, objective, and organization. After the organization has been developed to achieve a specific objective with a particular audience, the visuals can be considered. Which key ideas in the organization require a visual display to effectively communicate or emphasize them? The visual displays now become billboards which are coordinated towards speeding the audience down a highway-a highway which leads towards achieving the briefing objective.

Graphical perception. When a graphic display is prepared, quantitative data is encoded in the form of words, numbers, and graphics. This encoded information must then be properly decoded by the viewer. If the decoding is successful, the viewer interprets the briefer’s intended message and the visual is a success. If the decoding process fails, the visual display is a failure.

Briefers must realize that there are psychophysical limitations to human ability to correctly interpret what the eye sees. Difficulty in decoding a visual display increases quickly with the amount and complexity of the information presented. The brain is fast at absorbing visual stimuli but often slower at interpreting it. Visual displays which are difficult to interpret cause presentations to drag. Unnecessary changes from visual-to-visual, such as changes in format, typeset, color, and size, make it harder to interpret visual displays. This problem is compounded by the fact that different individuals assimilate information at different rates.

In order to insure that graphical displays do not tax the perceptual limitations of the viewer, presentation graphics must be designed to effectively communicate the desired messages to the decision maker. The following sections provide some valuable guidelines for the design of visual displays which will successfully complement the communication of analytical insights to the decision maker.

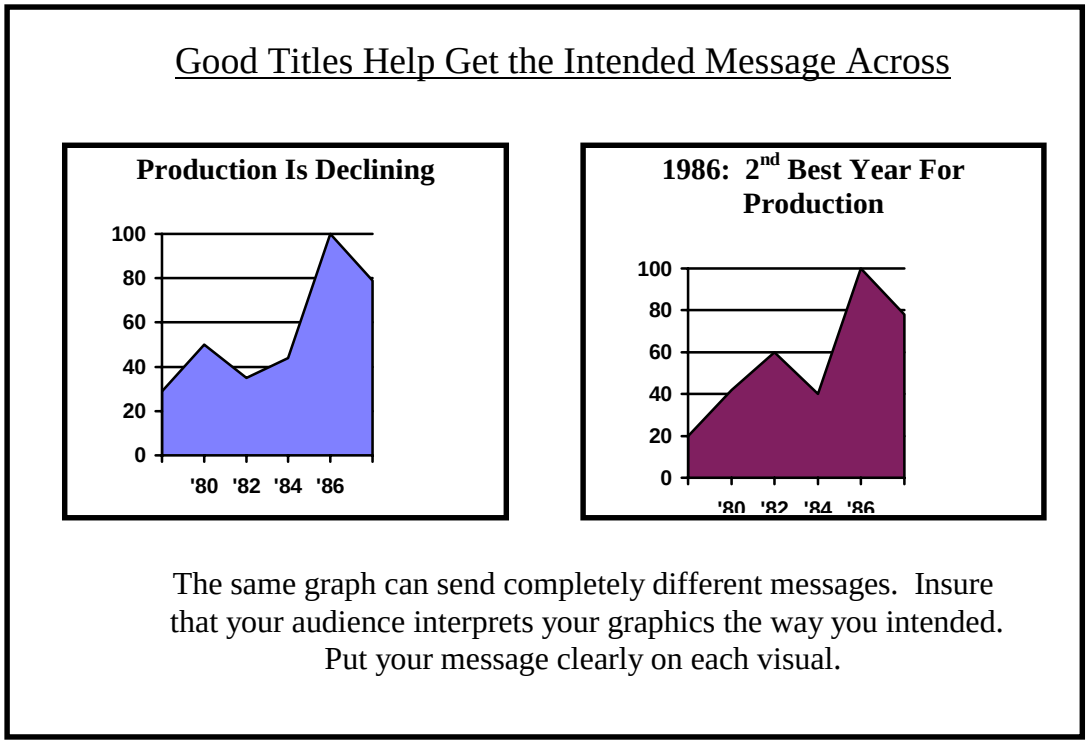
Three steps to successful visuals. In order to design effective visual displays, the briefer should follow these three steps:

1. Identify the message;
2. Select the graphic form;
3. Obey the rules.

Unfortunately, too many briefers begin at Step 2 by the first selecting a favored graphical form (bar chart, pie chart, table, etc.), and then trying to force a message into an inappropriate or ineffective display. For any graphical display to be effective, the briefer must follow these three steps in the prescribed order.

Step 1: Identify the message. The first step in designing a visual is to determine the message. Which key idea from your organization do you want to communicate/emphasize? When designing a visual to communicate a specific key idea, complete this statement: "After looking at my visual, I want the viewer to…?" *Demand an active response.* If you complete the statement with some fuzzy words' like appreciate or understand, then you don't have a measurable objective for that visual. If, on the other hand, you want the viewer to *compare* or *identify*, then you have zeroed in on a clear message with an achievable objective.

Put the message on the visual. Once you have identified a concrete message which you want your visual to communicate, *put it in writing*. Facilitate the decoding and interpretation of your visual by placing the message on the visual in writing. This "bottom-line message" doesn't necessarily have to be the title. It can be in a subtitle, a footnote, or even a cloud or an arrow. The point is to put the message on the visual and make it **STAND OUT.** This will help eliminate any possible misinterpretations of your visual, and will ensure that the visual message is consistent with the purpose of your briefing. The figure below shows how different titles can cause the same graphic to communicate two completely different messages. This also demonstrates how easy it is to misinterpret a graphic which does not contain an effective title.

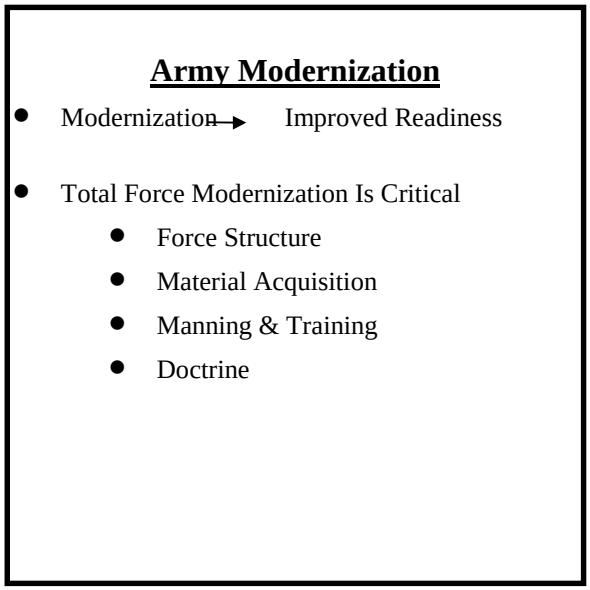


Step 2: Select the right graphic form. Once the message has been identified, the next step is to select the type of graphic which best communicates that message. There are many types of graphics and each type is generally best suited for communicating a particular type of message. Do not pick your favorite type or a "pretty" graphic and try to fit your message to that graphic. *Select the graphic which best supports your message.* The rest of this section demonstrates some of the more common types of graphical displays.

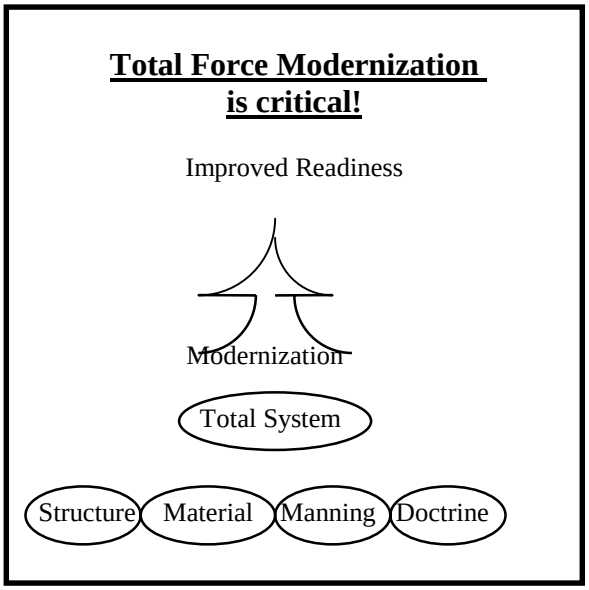
Text charts. Text charts are the easiest type of graphic to prepare. For this reason, they are probably the most frequently seen and most commonly misused type of graphic. When designing a text chart, it is important to remember that words are not visuals. Ask yourself: "Is it really a visual, or just a visible verbal?" Pictures, clouds, and arrows used in conjunction with words can create visual effects which make the text "come alive."

Text charts are effective for introducing and summarizing topics, explaining important ideas, and for connecting main ideas. Text charts should be as concise as possible, and it is best to use bullets rather than entire sentences or paragraphs of text. For ease of reading, bullets should be balanced in length and grammatically consistent (same tense, person, all active or passive, etc.). There is no absolute rule concerning the maximum number of bullets or the maximum number of words in each bullet, but a good rule of thumb is no more than 7 bullets with a maximum of 7 words each.

Enhance Ordinary Text Charts with Clouds & Arrows



Ordinary Text Chart



Clouds, arrows, and pictures can make ordinary text charts "come alive"

Tables. Tables are clear, exact, and convenient. They display numbers, but it is difficult to quickly make comparisons or identify trends while looking at numbers in a table. If you properly completed Step 1 (Identify the Message), then you will usually find that a different type of graphic is more suitable for communicating your message. However, tables are useful when it is important that the viewer know and remember exact numbers. This happens fewer times than we might initially think. Tables are good backups for other graphics in case the decision maker asks specific questions about the data.

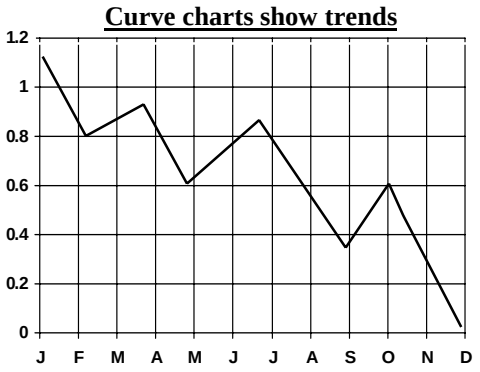
Tables show specific data.

Annual spending ($B)

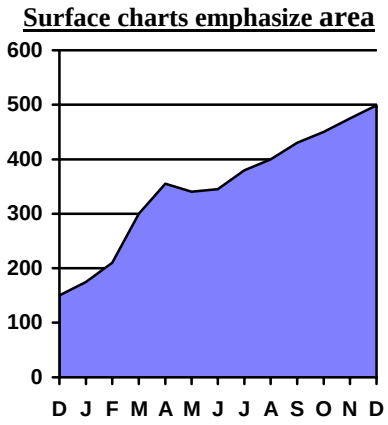
	FY '65	'70	'75	'80	'85
Procurement & RDTE	7.6	9.0	10.8	13.4	19.0
Personnel costs	9.1	11.3	13.8	19.5	26.5
other	4.9	5.8	6.7	8.2	10.8

Remember: tables can be too specific. Table after table will quickly irritate or lull most audiences into a stupor.

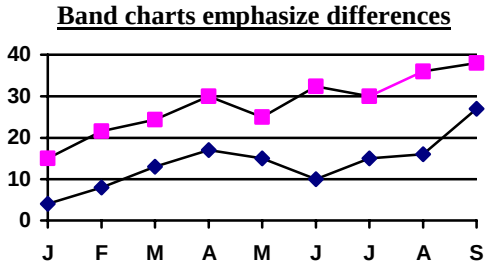
Curve or Line Charts. Curve charts effectively show trends and time series data by showing one item at different points in time as a single, unbroken line. Multiple lines shown on a single chart, but each line must be clearly distinguishable from the other lines through the use of patterns or color. Again, there is no absolute rule concerning the maximum number of lines to place on a single chart, but a good rule of thumb is to place no more than four lines on a single chart.



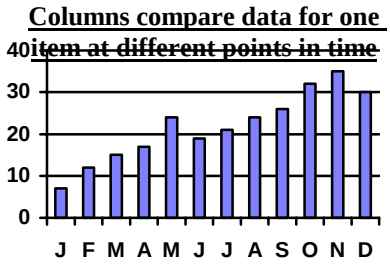
Surface Charts. A surface chart is simply a single line chart that is emphasized by shading under the line. This sounds like a very subtle change, but it completely changes the viewer's perception of the chart. Shading emphasizes the size of the total amount rather than the differences or changes in amounts. Shading also obscures points along the line and encourages the viewer to compare the area under the line against the area above the line.



Band charts. A band chart is a line chart with two or more lines and the area underneath each line shaded differently. Band charts focus attention on the area between the curves and emphasizes the differences between them. This difference may be used to depict inventory levels, shortfalls, etc. Band charts are best used when each curve always represents an amount greater than the curve under it. Band charts are not normally effective when the curves intersect.

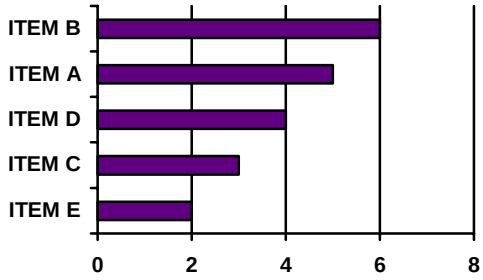


Vertical Bar or Column Charts. Vertical bar charts compare the data for the same item at specific intervals of time. The height of each column is used to represent each respective quantity and demonstrate how the quantities varies from time period to time period. Consistent time intervals should be used. If more than approximately 12 time periods are going to be used, then a curve chart may be more effective.



Horizontal Bar Charts. Horizontal bar charts are similar to vertical bar charts except that horizontal bar charts are generally used to compare the data for different items at the same point in time. Here, length of the bar is used to represent each quantity. The bars should not be broken, but they should be arranged in ascending or descending order to help the viewer identify trends or rank order the items.

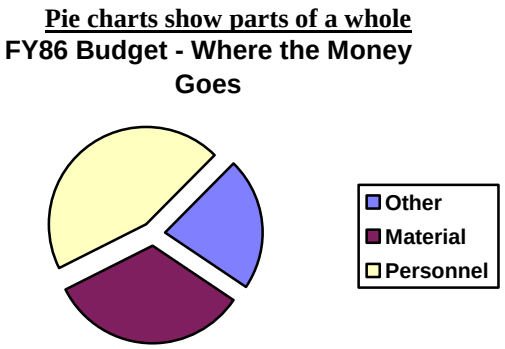
Horizontal bars compare different items at the same point in time



Histograms. Frequency polygons or histograms show distributions. Histograms group items in a population of like items into groups by magnitude of a particular attribute of interest. These groups are then displayed as columns which represent the proportion of the entire population which falls within each respective group. A particular attribute is selected as a basis of comparison. This attribute is generally divided into equal intervals which span the entire range of values for the population. These intervals are represented on the horizontal axis of the chart and the height of each respective bar represents the proportion of the entire population which had values falling within the respective interval.

Pie Charts. Pie charts show a composite whole and the proportion that each component part represents of the composite whole. The composite whole cannot get larger, so any increase in any one component must occur at the expense of another component. When using pie charts, it is important to label each "slice" of the pie. Without labels, it is extremely difficult to compare accurately the differences between the slices.

Pie charts show parts of a whole



Pictographs. Pictographs are similar to vertical bar charts and are often used to make the same kind of comparisons that are made using either vertical or horizontal bar charts. The difference with pictographs is that, rather than using bars as a basis for comparison, pictures or icons representing the item of comparison are used.

The basis for comparison is usually height, but the pictures or icons are generally drawn to scale. As the icons are drawn proportionally, comparisons between items become greatly exaggerated, distorting the quantitative differences in the actual data. The viewers tend to compare items on the basis of area rather than height. For this reason, *pictographs are generally a poor graphic for presentation use*.

Pictures. Pictures can be very effective in communicating a message to the audience. Pictures have great impact and can put key ideas and concepts into a perspective which relates directly to the audience. Clouds, arrows, and other pictorial symbols can effectively emphasize and draw

the viewers' attention to important ideas. Lessons learned during the audience analysis process will help in selecting the proper picture. You must make the connection between your information and what is important to your audience. Pictures are often very effective in making the necessary connection.

Lack of creativity is often a complaint which arises when the use of pictures is discussed. People often complain, "I'm not an artist, I'd like to use pictures but I'm not creative enough to think of the right kind of picture to use." This is a common problem but is easily solved. *Borrow pictures!* Look through other reports, magazines, or Clip Art packages to get ideas. Watch other briefers and use some of their (good) ideas. There are many sources of ideas for pictures which can be used in briefings. These ideas do not have to be original as long as they work. Many people build personal files of effective pictures and graphics which they have seen or used in the past to give themselves ideas for future presentation.

Step 3: Obey rules. There are literally hundreds of rules for the preparation of effective visuals. However, each of these rules can be addressed by considering the four basic categories listed below.

Clear Vision. Visuals should be designed so that they are easy to see and read. The visual should use the entire field available for layout. Avoid trying to squeeze the visual into a small section, leaving predominately blank page or slide for the viewer to stare at . Always ensure that all print, icons, and pictures are large enough to be seen by every member of the audience.

When deigning charts, ensure that each line, bar, and pie slice is clearly discernible. Do not clutter the data region with unnecessary information or marks. Keep scale tic marks outside the data region. Do not let labels interfere with the data. *Make the data stand out.*

Clear Understanding. Keep visuals as simple as possible. Keep your visual displays consistent from visual to visual. Use the same colors, type, format, and layout from visual to visual. Make changes only when you need a critical idea to stand out. Avoid using needless decoration ("chart junk") on the visuals. Facilitate the decoding process; provide comprehensive labels, but avoid complex legends. Remember to think of your visuals as billboards along the side of the road. Create your billboards so that they help speed the viewers along their journey. Do not let your visuals slow the audience down. Think about intended message of the visual. If anything on the visual detracts or does not help get that message across - *remove it*.

Scales. Choose scales and tic mark intervals that are easy to read and understand. Use as much of the data region as possible. Do not insist that zero (0) always be included in the scale. If there is a valid reason for not including zero, use another starting point. If you do not include zero in the scale, be sure that you point this out to the viewer. There are times when subtle variations in data need to be emphasized but are lost if entire bars starting at zero are shown. Avoid using scale breaks. Scale breaks often add confusion and make charts harder to read.

Integrity. Visual data can be easily manipulated to provide a distorted picture of the facts. This misrepresentation can occur unintentionally. Misuse of scales or adding perspective to scales are common ways in which data can be distorted. Changes in scale and/or the shape of a chart can greatly affect the way that chart is interpreted. The briefer should be prepares to justify his choice of scale and shape of a chart. An example of misuse of scale could include the use of a logarithmic scale to make non-linear data appear linear. Another misuse involves adding perspective or 3-D to bars, columns, or pie slices. A small slice of the pie can be made to appear as the largest slice by adding 3-D to the pie and orienting the pie so that the piece in questions presented directly to the viewer. Decorative additions, often referred to as "chart junk," can distort the true meaning of the data by making the chart difficult to read. Avoid fancy displays which distort the data. After designing your charts, objectively examine them to insure that you have not distorted the true meaning of the data.

Using Color. Many briefers try to improve their graphics by adding color. Adding color can make visuals more appealing, however, the indiscriminate use of color can add distractions to an otherwise effective graphic.

Adding emphasis to an item on the visual can be accomplished through the selection of a warm color (red, orange, or yellow) to portray that item. This makes it appear closer and stand out. The opposite effect can be achieved through the selection of a cool color will make the object appear more distant and less important.

When constructing legends for bar graphs and surface charts, do not choose colors indiscriminately. Dark colors appear to be "heavier" than light colors. Stacked column or horizontal bar charts should have darker colors nearer the bottom or the left, respectively. Colors used should be successively lighter with the lightest color at the top for columns or at the far right for horizontal bars. This will make the chart appear to be balanced and easier to read.

Colors can be used effectively to emphasize or discriminate. Do not use colors to decorate. Avoid creating a "Christmas tree" chart. Limit the number of colors used in each visual and insure that the choice of colors is consistent from visual to visual. Use a different color for those critical ideas which must stand out and demand audience attention.

A final note about visuals. Effective visuals can greatly enhance your ability to successfully communicate your message. Following the rules and using the ideas outlined above will help insure that your visuals are effective.

The development of effective visuals requires careful planning and work. *Creation of effective visuals is an iterative process.* Once you have identified the message you wan to communicate, you may try 3 or 4 different types of charts before determining which type best communicates the message. After determining which type best communicates the message. After determining the best type of chart, it may take several iterations to find the best layout. *If the briefing is important, it is worth the time to develop effective visuals.*

Briefing With Impact

Effective delivery of the briefing is critical. A poor delivery can undo months of analytical work and briefing preparation. The purpose of this section is not to reiterate the do's and don'ts of effective speaking that can be found in the many books and articles written on the subject. Instead, the following paragraphs contain a collection of guidelines which are not commonly found in the existing literature. These tips and suggestions come from a variety of experienced and successful Army analysts who have earned reputations as expert briefers. Delivery styles vary from one individual to another; however, the following briefing suggestions and presentation practices can be used to enhance the delivery techniques of novice briefers as well as experienced presenters.

Rehearsals. The successful delivery of a briefing seldom happens by accident. After the preparation of the briefing package has been completed, the next key step involves rehearsing the presentation. Even the expert briefers do not omit this key step. They realize that, although briefings seldom go exactly as rehearsed, those who take time to rehearse are far better prepared to handle the inevitable "curve balls" that decision makers always seem to bring up during the briefing.

Rehearsals should be conducted just as if they were the actual briefing and should include all visual aids and demonstrations just as they will be used in the actual briefing. The presenter should not treat the rehearsals as a game; "*if I was really giving the actual briefing, I would . . .*" The presenter should select qualified helpers who can (and will) provide thorough constructive criticism of the briefing. Critics should role play the part of the actual audience, but hold comments and recommendations until the briefing is complete. Audience role playing is important because it gives the presenter and idea of what to expect from the decision maker and helps the presenter anticipate and prepare for possible questions. Rehearsals should be timed to ensure that the actual presentation does not exceed its allotted time. The presenter should also keep in mind that rehearsals tend to go faster than the actual briefing, so the rehearsal should run shorter than the total allotted time.

Controlling nervousness. According to a recently published article, an informal survey was conducted to compile a list of those things that people fear most (i.e. darkness, snakes, falling, etc.). The *second* highest fear on this list is death, while the number one fear reported by those interviewed happens to be public speaking. In other words, this article reports that many people would rather die than give a briefing. Nervousness is a natural reaction in anticipation of presenting a briefing. All briefers, including experienced presenters, encounter some degree of nervousness prior to the actual briefing. Successful briefers admit that the nervousness never completely goes away; however, nervous energy can be channeled into enthusiasm. It can generate an increased awareness which can be very beneficial during the briefing. This comes with practice, and realistic rehearsals are very effective in helping the presenter channel this nervous energy into an enthusiastic, well-prepared delivery.

The delivery. Once all the preparation and rehearsals have been completed, all that remains is to deliver the briefing. Effective delivery of the briefing is critical. Many high level decision makers base decisions on their perception of the presenter and the presenter's delivery as much as on the actual content of the briefing. If the presenter is not confident and does not believe in his work, why should the decision maker? The following suggestions offer insights into some successful delivery techniques.

The Briefing Process

1. Analyze the audience.
2. Specify the objective.
3. Sequence the key ideas.
4. Create visual displays.
5. **Deliver the briefing.**
6. Re-package for the next key player.

The first 20 seconds. First impressions are lasting impressions, and the first 20 seconds of a presentation are critically important. In many cases, the audience is already formulating an impression of the presenter before he even begins to speak.. Once the members of the audience formulate their initial opinions about the presenter, they will be more likely to look for signs that tell them that their first impression was right rather than to look for reasons to change their first impression. Here are some subtle, yet effective, tips for creating the right first impression during the first twenty seconds.

- ◊ **Entry.** The presenter's entry makes a strong statement. Does the entry portray confidence, enthusiasm, and an ability to "take charge," or does the entry portray someone who is simply trying to survive the briefing? A sharp, confident entry up to the front of the briefing room makes a positive statement about the presenter.
- ◊ **Title slide.** The title slide or first visual shown sets the tone for the rest of the briefing. Is it appropriate, neat, and does it convey the "right" message? Many title slides simply display the briefing topic or an organization's logo. Presenters should give some thought to using more creative title slides which use visual displays designed to reflect the topic and capture the audience's attention.
- ◊ **Opening remarks** should relate the topic of the briefing to the concerns of the audience. The opening statements should correspond to the visual messages displayed on the title slide. If standard opening remarks are required or prescribed, ("Good morning sir, my name is…, the topic of this briefing is…, the classification is…"), these statements should be made in such a way as to portray confidence enthusiasm, and an ability to take charge and get the job done.

Nonverbal communication. The spoken words and visual aids are not the only form of communication between the presenter and the audience. Nonverbal forms of communication send strong messages which can support or contradict the messages presented through the spoken words and visuals. In order to insure that these nonverbal signals do not send mixed messages, briefers must learn to control actions and mannerisms such as eye contact and body language.

Eye contact forms a momentary bond between two people. It communicates interest and trust, and can reveal an individual's true feelings. An inability to make eye contact is usually perceived to be a sign of fear or uncertainty. The presenter should make a conscientious effort to make momentary eye contact with every member of the audience, giving primary attention to the decision maker and any other key individuals.

Body language can also communicate and individual's true feelings in a revealing way. Gestures, movement, posture, and facial expressions must not be distracting, but should be used naturally to support messages communicated through the spoken words and visual displays. Natural gestures convey a sense of openness, and help put the audience at ease with the presenter. Unnatural, staged, or contrived body language can be distracting, and can be interpreted as caused by nervousness or non-commitment. Lack of body gestures reflects fear and rigidity. Military positions, such as parade rest, can reflect the "yes man" image, and give the audience the impression that the presenter may not be totally open or candid about the contents of the briefing. The presenter should relax and *be natural.* Gestures and movement used in normal conversations are generally acceptable in most presentations. Posture should be erect but not rigid. Smile whenever appropriate!

Using notes. The use if notes should be avoided whenever possible. Heavy reliance on notes or reading of notes detracts from credibility and gives the audience the impression that the presenter really does not know the material. The audience then begins to feel that the expertise resides in the notes, and not with the presenter. If the presenter must use notes, he should try to use as few notes as possible. The presenter should try to reduce the need for notes to a few key facts or statistics. When the notes are no longer needed, they should be placed aside to prevent the presenter from waving them at the audience or playing with them while talking.

Verbal-visual cueing. Timing in the presentation of visuals is critical. Too many briefers reveal the visual first, then attempt to talk about it. By then it is too late. The members of the audience have already decoded the visual information and have formed their own opinions. Successful briefers suggest that viewers should be "primed" for the next visual. That is, the briefer should *verbally* plant the intended message in the minds of the audience before revealing the visual. When the visual is revealed, the viewers will be looking for the intended message. This technique, called "verbal-visual cueing," is a subtle, yet effective way to control what the audience sees in each visual.

Handling questions. One of the best ways to build credibility during the briefing is through the proper handling of question. Successful briefers suggest that the key to answering questions lies in the proper handling of the *questioner*. Here are some tips on how to respond to questioners:

- ◊ Receive all questions cordially.
- ◊ Maintain eye contact with the questioner.
- ◊ Make sure you understand the questions. If not, ask the questioner to restate it, or rephrase it yourself.
- ◊ Don't shoot from the lip. Avoid instantaneous answers. Take time to think before answering.
- ◊ Preface each answer with a polite lead-in, such as "Your point is well taken . . ." or "I'm glad you asked that question . . ."
- ◊ Keep your answers direct and simple.
- ◊ If the answer is not known, admit it, and tell the questioner you'll get the answer.

Receive Questions Cordially

Instead of: "You don't understand."
Try: "Your point is well taken."
OR "I didn't mean to slight that"

Instead of: ""You missed my point."
Try: "I should have stated that more clearly."
OR "Let me clarify that a bit."

A good rehearsal with good audience role playing will identify questions which are likely to arise. Presenters must anticipate likely questions and be prepared to provide correct answers, complete with supporting visuals, if necessary.

Closing. As the presentation draws to a close, the briefer may need to ask for a decision or seek some type of commitment from the decision maker. As a lead-in to asking fir a decision for a decision, the briefer should summarize the main points of the presentation, and then present the bottom line or recommendations, if appropriate. Briefers must be careful to present recommendations as recommendations, not as decisions. It must be made obvious that the element of choice is still left open to the decision maker.

In many decision situations, the decision maker faces tough choices. The point at which the decision must be made can be a rough time for the decision maker. Recognizing this, successful briefers often provide decision makers with convenient "life lines." One technique involves asking for the decision in a way which does not contribute additional pressures to the decision maker. Instead of demanding: "Sir, we need your decision now," try asking: "Sir, what additional information can I provide you now to assist you with this decision?" Another technique, which is more appropriate for longer briefings, involves calling for a short break just before asking the decision maker to make a commitment. This momentarily takes the pressure off the decision maker, and gives him time to think. It also provides the decision maker with an opportunity to consult with his own experts. When the briefing is reconvened at the end of the break, the decision maker generally feels more comfortable with the issues and is better prepared to make an enlightened decision.

Re-package for the Next Key Player

In many decision situations, analytical results must be presented sequentially to several key individuals involved in the decision making process. One common mistake involves trying to prepare and present one briefing package to be used in separate presentations to several different decision makers. This practice is seldom successful because it overlooks the fact that each key player makes decisions based on a unique set of knowledge, attitudes, fears, experience, and needs. Successful briefers recognize that each decision maker must be treated individually, and specific briefing packages, tailored for each decision maker, should be prepared. This does not suggest that the briefer should slant the analytical findings to suit the prejudices of the personalities involved. It does, however, suggest that the same analytical findings can and should be packaged to support the different decision making style of each of the key players.

The analyst must understand and appreciate the *cognitive style* of each decisionmaker to be briefed. An individual's cognitive style describes the way he acquires information, evaluates alternatives, and makes a decision. Technical people usually display a cognitive style strikingly different from non-technical people. Technical people tend to be "receptive." That is, they tend to be very systematic, and they tend to focus on the examination of all the data. Non-technicalpeople, on the other hand, tend to be "perceptive." These individuals tend to be more intuitive; they tend to focus on patterns and deviations from the norm.

The Briefing Process

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As the analyst presents his analytical results to different individuals in the hierarchy en-route to the final decision maker, he should constantly strive to repackage his results to suit the cognitive style of each audience he encounters. The re-packaging process involves performing each step of the briefing process for each key player to be briefed. Analysts are encouraged to take the time to perform these steps to insure that the impact of the analysis is effectively communicated to each of the key players in the decision making process.

A Final Note

An excellent analysis can be undone if the results are articulated poorly to the decision makers. The Briefing Process suggested above provides a systematic approach to the presentation of study results so that technical and non-technical decision makers can readily understand the impact of the analytical findings. Viewed in this way, the Briefing Process provides the link between study efforts and decision actions. With this orientation, analysts and study planners can approach all analytical efforts in ways which are more responsive to the true needs of decision makers at all levels of the Army leadership.

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The guidelines and suggestions presented in the preceding chapters have been designed to motivate the analyst toward initiating his or her study effort in an organized manner and with an open-minded approach. Following these guidelines and suggestions will contribute to successful effort - from planning the study through communicating the results. While the guidelines presented here offer useful information and practical insights into the analytical process, they are by no means comprehensive. The ideas presented can provide a valuable orientation, and the analyst who has read this booklet is off to a good start.

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